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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/609,205

06/27/2003

Wei Yang

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7326

7590

09/15/2004

Justin Boyce, Esq.

DECHERT LLP

975 Page Mill Road

Palo Alto, CA 94304-1013

EXAMINER

SONG, SARAH U

ART UNIT

PAPER NUMBER

2874

DATE MAILED: 09/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/609,205

Applicant(s)

YANG ET AL.

Examiner

Sarah Song

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 0603.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The prior art documents submitted by the applicant in the Information Disclosure Statement filed on June 27, 2003 have all been considered and made of record (note the attached copy of form PTO-1449).

Specification

2. The disclosure is objected to because of the following informalities: Examiner suggests amending paragraph [0001] to update the status of U.S. Patent Application Serial No. 09/975,117 as now issued U.S. Patent 6,706,154.

Appropriate correction is required.

Claim Objections

3. Claim 13 is objected to because of the following informalities: in line 2, Examiner suggests deletion of “2” and in line 5, Examiner suggests deletion of “6”. They appear to be typographical errors.

4. Claims 19 and 20 are objected to because of the following informalities: Examiner suggests amending the claims to depend from claim 18, instead of claim 13, to provide proper antecedent basis for the term “said protective material”.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 13-15 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brambilla et al. (U.S. Patent 6,643,442) in view of Lackritz et al. (U.S. Patent 6,724,968).**

7. Regarding claim 13, Brambilla et al. discloses an integrated optical device 25 formed in accordance with a process, comprising the steps of:

- providing a glass substrate 5 having a base index of refraction;
- providing a UV light beam (column 6, lines 41-43);
- focusing said beam on a portion of said glass substrate in order to form a region of increased refraction (column 5, lines 55-57, 62-65); and
- defining a first elongated optical channel having an increased index of refraction relative to said base index of refraction, said first optical channel for guiding light transmitted there along (see claim 79).

8. Brambilla et al. does not expressly disclose the step of scanning an elongated region of the glass substrate with the beam in order to define the first elongated channel.

9. Lackritz et al. discloses the step of scanning an elongated region of the glass substrate with the beam in order to define the first elongated channel (column 10, lines 9-15)

10. Brambilla et al. and Lackritz et al. are analogous art as pertaining to photodefined optical waveguides.

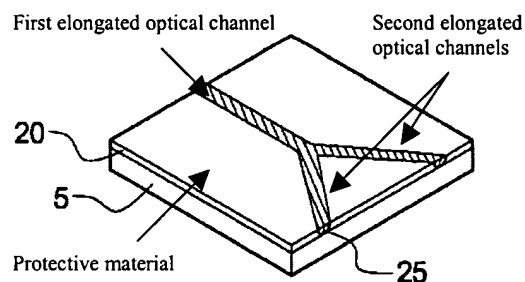
11. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Brambilla et al. to comprise the step of scanning an

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elongated region of the glass substrate with a beam in order to define the first elongated channel, as taught by Lackritz et al.

12. One of ordinary skill in the art would have been motivated to modify the method of Brambilla et al. to comprise the scanning step of Lackritz et al. in order to reduce fabrication time and cost by eliminating the requirement for photolithographic masks, as taught by Lackritz et al. (column 17, lines 59-62).

13. Regarding claim 14, Brambilla et al. also discloses forming a plurality of second elongated optical channels in said glass substrate, wherein said first optical channel if operative for transmitting light to said plurality of second elongated optical channels such that said transmitted light is divided among said plurality of second elongated channels, thereby forming an optical beam splitter.



14. Regarding claim 15, Brambilla et al. does not expressly disclose the step of forming a thermo-optic switch across at least one of said second elongated optical channels so as to form an optical switching device for switching light transmitted through said first optical channel to a selected one of said second optical channels.

15. Lackritz et al. discloses the step of forming a thermo-optic switch 1120 across at least one of second elongated optical channels so as to form an optical switching device for switching light transmitted through a first optical channel to a selected one of said second optical channels (column 24, lines 22-28).

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16. Since the method of Brambilla et al. in view of Lackritz et al. would perform equally well to provide any known integrated circuit structure with reduced fabrication time and costs, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form a thermo-optic switch across at least one of said second elongated optical channels so as to form an optical switching device for switching light transmitted through said first optical channel to a selected one of said second optical channels of Brambilla et al.

17. Furthermore, one of ordinary skill in the art would have been motivated to form the thermo-optic switch across at least one of said second elongated optical channels so as to form an optical switching device for switching light transmitted through said first optical channel to a selected one of said second optical channels of Brambilla et al. in order to provide a tunable switch with improved switching efficiency and reduced manufacturing time and costs.

18. Regarding claim 17, the glass substrate is doped with dopants chosen from the group consisting essentially of germanium, tin and boron. That is, Brambilla et al. discloses that the glass substrate is doped with tin (column see claim 79).

19. Regarding claim 18, Brambilla et al. also discloses the process, including the step of encasing at least a portion of said elongated optical channel in a protective material (i.e. surrounding substrate material).

20. Regarding claim 19, the protective material is glass (column 6, lines 54-55).

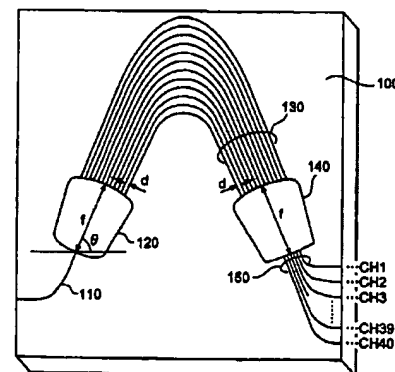
21. Regarding claim 20, the protective material is a doped glass (i.e. photosensitive glass doped with tin, column 6, lines 51-53).

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22. **Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brambilla et al. and Lackritz et al. as applied to claim 13 above, and further in view of Katayama (U.S. Patent 6,665,466).**

23. Regarding claim 16, Brambilla et al. does not expressly disclose wherein the first optical channel receives a multi-wavelength light beam, providing a beam splitter for splitting said multi-wavelength light beam into a plurality of multi-wavelength light beams; forming a plurality of second elongated optical channels for guiding said plurality of multi-wavelength light beams, wherein each said second elongated optical channels guides a selected one of said plurality of multi-wavelength light beams, wherein each said second elongated optical channels has a different length such that light transmitted there upon exits each said second optical channel with a different phase shift; and providing a lens region for refocusing said plurality of phase shifted multi-wavelength light beams into a plurality of narrow wavelength light beams of differing wavelengths, thereby forming an optical wavelength demultiplexer.

24. Katayama discloses a first optical channel 110 that receives a multi-wavelength light beam, providing a beam splitter 120 for splitting said multi-wavelength light beam into a plurality of multi-wavelength light beams; forming a plurality of second elongated optical channels 130 for guiding said plurality of multi-wavelength light beams, wherein each said second elongated optical channels guides a selected one of said plurality of multi-wavelength light beams, wherein each said second elongated optical channels has a different length such that light transmitted there upon exits each said second optical channel with a different phase shift; and providing a lens region 140 for refocusing said plurality of phase shifted



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multi-wavelength light beams into a plurality of narrow wavelength light beams of differing wavelengths, thereby forming an optical wavelength demultiplexer.

25. Brambilla et al., Lackritz et al. and Katayama are analogous art as pertaining to integrated optical circuits.

26. Since the method of Brambilla et al. in view of Lackritz et al. would perform equally well to provide any known integrated circuit structure with reduced fabrication time and costs, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form first optical channel receives a multi-wavelength light beam, provide a beam splitter for splitting said multi-wavelength light beam into a plurality of multi-wavelength light beams; form a plurality of second elongated optical channels for guiding said plurality of multi-wavelength light beams, wherein each said second elongated optical channels guides a selected one of said plurality of multi-wavelength light beams, wherein each said second elongated optical channels has a different length such that light transmitted there upon exits each said second optical channel with a different phase shift; and provide a lens region for refocusing said plurality of phase shifted multi-wavelength light beams into a plurality of narrow wavelength light beams of differing wavelengths, thereby forming an optical wavelength demultiplexer.

27. One of ordinary skill in the art would have been motivated to form the demultiplexer according as shown by Katayama by the method of Brambilla et al. in view of Lackritz et al. in order to manufacture a complex integrated optical waveguide structure with reduced manufacturing time and costs.

Conclusion

28. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

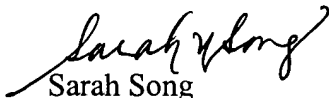
29. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nishii et al. (U.S. Patent 5,763,340) and Pavlopoulos (U.S. Patent 4,022,602) disclose method of fabricating optical waveguides by providing a glass substrate, providing a light beam, and focusing said light beam. Nishii et al. further discloses a UV light beam. Pavlopoulos further discloses scanning the light beam to form an elongated channel.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sarah Song whose telephone number is 571-272-2359. The examiner can normally be reached on M-Th 7:30am - 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on 571-272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sarah Song
Patent Examiner
Group Art Unit 2874